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SEALANT GUN

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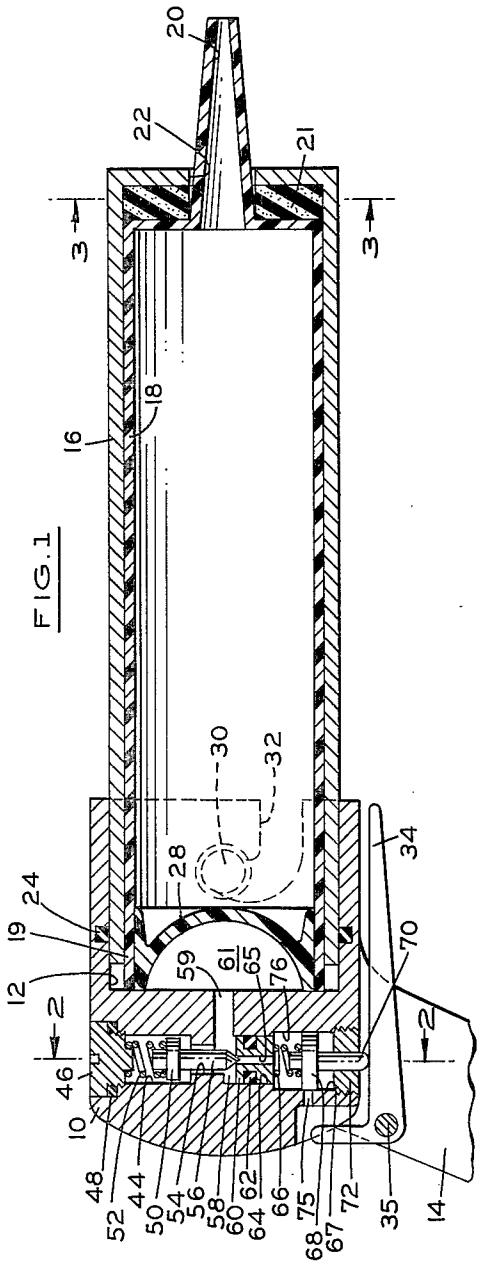


FIG. 1

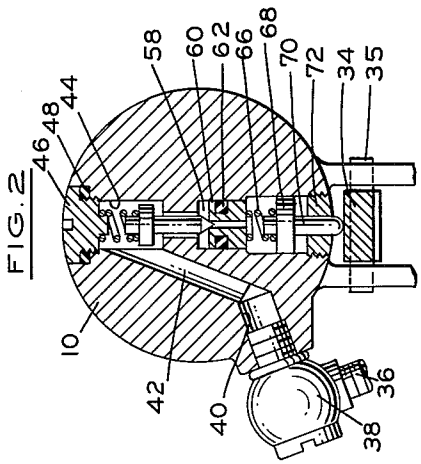


FIG. 2

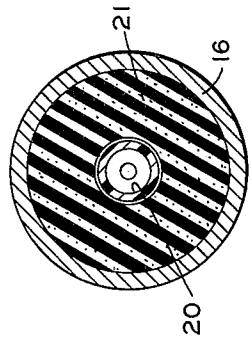


FIG. 3

INVENTOR.
CARL B. PENN

BY

Burton & Parker
ATTORNEYS

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SEALANT GUN

Carl B. Penn, Birmingham, Mich., assignor to Pyles Industries, Inc., Southfield, Mich., a corporation of Michigan

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This invention relates to improvements in sealant guns and other similar viscous fluid dispensing devices.

U.S. Patents 2,838,210 and 3,042,268 disclose air-operated sealant dispensing guns in which a polyethylene sealant containing cartridge is removably telescoped into a metal barrel with a peripheral lip on the cartridge overlying the rear edge of the barrel. The barrel and inserted cartridge are thereupon sealingly connected at their open rear ends to a valve block by means of a U-shaped bayonet frame and screw assembly; the lip of the cartridge effecting an air-tight seal between the barrel and valve block. The valve block contains a valve for controlling the admission of air pressure to the rear face of a piston in the cartridge to urge the sealant out of the nozzle end of the cartridge. While such guns have met with substantial commercial success there has existed for some time the need for an air-operated gun which would accept the more conventional type paper cartridge or a cartridge of somewhat cheaper construction than those required for the prior art guns. There has also existed for some time the need for a gun of somewhat simpler and less expensive construction. The gun disclosed herein fulfills both objectives.

An object of the invention is the provision of an improved gun which obviates the need for a peripheral flange on the rear of the cartridge thereby enabling the gun to accept a conventional paper-type sealant cartridge.

Another feature of the gun is that it does not require the U-shaped bayonet clamp and screw combination in order to lock the barrel against the valve block and instead a very simple socket is provided into which the rear end of the barrel and cartridge assembly is inserted and automatically sealed and locked thereby simplifying and speeding the exchange of a spent cartridge for a new one.

In accomplishing these objects the gun is provided with a forwardly opening socket-carrying air valve and trigger mechanism with the socket adapted to sealingly receive the rear end of the barrel and cartridge assembly. An air seal carried by the socket encircles the rear end of the barrel to seal against the escape of air from therebetween. The socket is provided with bayonet slots for receiving locking lugs on the barrel. The rear end of the cartridge projects beyond the rear edge of barrel to seat against the bottom of the socket, and a resilient pad is sandwiched under compression between the front of the cartridge and the inside surface of the front wall of the barrel, to urged the locking lugs continuously into interlocked engagement with the bayonet slots. The socket, barrel and cartridge are held in releasably locked and sealed engagement by the reacting face of the pad.

A meritorious feature of my improved sealant gun is that the compressible resilient means which is placed under resilient tension between the forward end of the cartridge and the forward end of the barrel when the rear end of the cartridge and barrel assembly is secured

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in place within the socket, is in the shape of an annular resilient element which grippingly encircles the discharge nozzle of the cartridge to resiliently position the nozzle.

Other objects, advantages and meritorious features will more particularly appear from the following description, claims and accompanying drawings, wherein:

FIG. 1 is a longitudinal sectional view through that portion of my sealant gun which includes barrel and cartridge assembly and shows the means which I employ to maintain a tight seal between the sealant containing cartridge and a wall of the socket;

FIG. 2 is a cross-sectional view taken on line 2—2 of FIG. 1; and

FIG. 3 is a cross-sectional view taken on line 3—3 of FIG. 1.

As stated herein this invention relates to a device or gun for dispensing viscous fluid such as is commonly employed as a sealant to seal up cracks or joints or as an adhesive to secure parts in place. It is employed in many industries. The device is in the form of what the industry terms a gun and comprising a frame and socket assembly indicated as **10** having a forwardly open socket portion **12** and a handle portion **14** which is broken away.

Associated with the frame socket assembly **10** is a barrel cartridge assembly consisting of a barrel **16** which may be formed of suitable metal or the like and which carries a cartridge **18**. This cartridge may be formed of plastic or paper or other suitable material and is of a size to be received within the barrel. It should be sufficiently non-yielding in axial compression so that when subjected to the stress of locking the barrel and socket together will not collapse axially. It is filled with a suitable sealant or the like and has a forwardly projecting spout or nozzle **20** which extends through an opening **22** in the forward wall of the barrel element **16**. The cartridge and nozzle may be of one or two piece construction though it is herein disclosed as being of one piece construction.

The socket portion **12** is provided with an interiorly disposed elastomeric sealing ring **24** which encircles and is imbedded within the inner wall of the socket and bears against the cylindrical outer surface of the barrel element **16** as shown in FIG. 1 to form a leak-tight seal therewith.

The cartridge element **18** is open at its rear end and slidably received within the cartridge is a piston or plunger **28** which is adapted to be advanced through the cartridge to dispense the contents thereof. The barrel **16** may be formed of any suitable metal or the like. It is provided on opposite sides with radially projecting lugs **30** adapted to be received within bayonet joint-like slots **32** formed in the cylindrical wall of the socket **12** as shown in dotted outline in FIG. 1. Upon relative rotation of the barrel and socket the same are interlocked together in a conventional manner. This construction permits the barrel and cartridge assembly to be securely locked within the socket when the rear end of such assembly is seated within the socket.

The cartridge is intended to be inexpensive so that empty cartridges may be thrown away and replaced by filled ones. A spirally formed paper cartridge, suitably coated, and of conventional construction, is intended. The type used in mechanical dispensing guns would be

satisfactory. The plunger 28 may be made of suitable plastic material such as polyethylene and is shown as so shaped as to be guided properly through the cartridge while maintaining sealed engagement therewith in its movement therethrough.

The plunger is adapted to be actuated by air pressure or the like which may be supplied from a suitable source, not shown, through a conduit 36 which is shown as communicating with a fitting 38 (FIG. 2) which fitting is threaded into a port 40 of the frame and socket assembly. This port 40 communicates through a passageway 42 with the interior of a valve mechanism receiving cavity 44 in the socket body all as illustrated in FIG. 2. This valve mechanism is adapted to be actuated by a control handle 34, pivotally supported at 35, and which handle is adapted to be gripped by the hand of an operator wielding the gun as is well understood.

This cavity 44 is closed by a threaded plug 46 which seats upon a sealing ring element 48, at the outer end of cavity 44.

Within this cavity 44 is disposed a valve element 50 held by a spring 52 normally to its seat upon the bottom of the cavity. When valve 50 is seated the passageway 54 about the stem 56 of valve 50, which stem extends through the passageway 54 from cavity 44 into the cavity 58, is closed. This cavity 58 communicates through port 59 with the socket cavity 61 rearwardly of the plunger 28 for the passage of fluid under pressure thereinto when the valve parts are in the open position as shown in FIG. 1. In this open position the valve operating lever 34 is shown elevated as it would be when gripped by the hand of an operator and as held up toward the barrel of the gun. In this position of FIG. 1 it is apparent that air under pressure entering cavity 44 through passage 42 from a source, would flow from cavity 44 through passageway 54 about valve stem 56 into cavity 58 and through port 57 into cavity 61 to actuate the plunger 28.

Within this second valve cavity 58, or rather within a downward extension 64 thereof, there is disposed a valve element 60. This element 60 carries an encircling sealer ring 62 which seals against the face of extension 64. The valve 60 rests upon a spring 66. The opposite end of the spring 66 bears upon the head 68 of a valve 70. This spring 66 normally holds the head 68 of valve 70 seated upon plug 72. It is only when the valve 70 is elevated, as shown in FIG. 1, through elevation of the control lever 34, that the valve 60 is lifted and in turn lifts valve stem 56 and valve head 50 off of its seat opening passageway 56 to flow of air under pressure therethrough. Normally such valves are seated.

When the valves 60 and 70 are seated, valve head 50 closing passageway 54 and valve head 68 seated upon plug 72, the air exhaust passage 75 which leads from cavity 76 to the atmosphere is open to exhaust air under pressure, as described, through port 59 into cavity 58 and through passageway 65 in valve 60 into cavity 76, wherein valve 70 is disposed. Such occurs when control lever 34 is released. Such valve is conventional structure.

It will be noted that when the barrel and cartridge assembly is received in place within the socket and locked thereto through engagement of the lugs 30 of the barrel within the slots 32 of the socket, that the rear end of the cartridge element 18 projects as at 19 beyond the rear end of the barrel element 16 and seats against the end wall of the socket. It will also be noted that there is provided an annular, compressible, resilient element or disc 21, which may be formed of rubber, such as foam rubber or other suitable resilient material, which disc, when the barrel is locked in the socket as hereinabove described, will exert a resilient force upon the cartridge holding it constantly under pressure against the bottom of the socket. Such disc must possess sufficient resiliency

to allow the cartridge and barrel assembly to be pressed into the socket and the barrel rotated to engage its locking lugs in the bayonet slots and maintain such in snug engagement.

Such resilient pressure of the disc 21 must also be sufficient to urge the rear end portion of the cartridge against the socket wall to establish an initial air seal therewith. This seal results from the responsive action of the disc 21 to the pressure imposed thereupon by locking the barrel and socket together and imposing the required pressure upon the rearwardly projecting end portion of the cartridge against the bottom of the socket.

The expansible disc 21 also snugly grips the nozzle 20 and holds the same securely, but with a certain amount of resilient yield, properly as it projects through the aperture 22 in the end of the barrel. This facilitates properly yieldably supporting the discharge nozzle as it is employed in distributing the viscous fluid as desired upon the work.

As air pressure is applied to the rear of the piston by opening the valve in the socket, escape of air from the gun to the atmosphere will be blocked initially by the peripheral edge abutment of the rear of the cartridge with the socket bottom wall. As this pressure increases or laterial forces of working with the gun tend to disturb such initial seal, seal 24 will come into play to prevent escape of air from between the barrel and socket. Escape of air down between the barrel and cartridge walls will be impeded by the tendency of the cartridge to expand outwardly against the barrel. Additionally, or ultimately, escape of such air will be substantially prevented by the disc 21 under its tight squeezing between the forward ends of the cartridge and barrel.

What I claim is:

1. A sealant gun comprising, in combination, a frame and socket assembly provided with a forwardly open socket portion, a barrel and cartridge assembly wherein a sealant containing cartridge is telescoped within the barrel and wherein the barrel and the cartridge each has an open rear end portion received within the socket portion of the frame and socket assembly, a nozzle communicating with the interior of the cartridge and projecting forwardly through an opening in the forward end of the barrel, resilient means interposed between the forward end of the cartridge and the forward end of the barrel, securing means operable to couple the rear end portion of the barrel within the socket and as a result of such coupling compressing said resilient means between the forward end of the cartridge and the forward end of the barrel which compression in turn urges the rear end of the cartridge sealingly against a wall of the socket.

2. A sealant gun as defined in claim numbered 1 characterized in that the resilient means which is interposed between the forward end of the cartridge and the forward end of the barrel when placed under compression acts as an air seal therebetween.

3. A sealant gun as defined in claim numbered 1 characterized in that air sealing means is interposed between a wall of the socket and the rear end portion of the barrel.

4. A sealant gun as defined in claim numbered 1 characterized in that the resilient means which is interposed between the forward end of the cartridge and the forward end of the barrel when placed under compression acts as an air seal therebetween, and further characterized in that air sealing means is interposed between the wall of the socket and the rear end portion of the barrel.

5. A sealant gun as defined in claim numbered 1 characterized in that the rear end of the cartridge which is urged sealingly against a wall of the socket projects rearwardly and freely of the rear end of the barrel into engagement with a wall of the socket.

6. A sealant gun as defined in claim numbered 1 characterized in that the resilient means which is interposed between the forward end of the cartridge and the forward

end of the barrel comprises a compressible resilient annular element encircling the nozzle of the cartridge and resiliently positioning said nozzle as it extends through the opening in the forward end of the barrel.

7. A sealant gun as defined in claim numbered 1 characterized in that air sealing means is interposed between a wall of the socket and encircling the barrel forwardly of the rear end of the barrel and cartridge assembly and adapted to form a seal between the wall of the socket and the wall of the barrel at different positions of the barrel fore and aft within the socket.

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LOUIS J. DEMBO, *Primary Examiner.*